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Please find below and/or attached an Office communication concerning this application or proceeding.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/595,312
Filing Date: April 06, 2006
Appellant(s): BEMING ET AL.

Roger S. Burleigh
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 18 January 2011 appealing from the Office action mailed 18 August 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 13-17 have been rejected.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

2004/0062192 A1	Liu et al.	04/01/2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Calvignac and Liu et al. (PG Pub US 2004/0062192 A1 hereafter Liu).

Regarding claim 13, APA discloses a control method for regulating the flow of data between a first transmitting radio network node and a second transmitting radio network node in a radio transmission network (figs. 1-4).

The limitation, said second transmitting radio network node receiving data from said first transmitting radio network node to be forwarded to plural user entities via an air interface (fig. 1).

The limitation, the first transmitting radio network node sends a capacity request (capacity request 19, fig. 4) to the second transmitting radio network node requesting

the second transmitting radio network node for permission to send an indicated number of data units that are pending in the first transmitting radio network node ("A capacity request frame, illustrated by arrow 19, is sent by SRNC thus informing Node-B's buffer 9 about the amount of pending user data in SRNC for UE1" page 4 lines 6-8).

The limitation, the second transmitting radio network node, in response to the capacity request, sends an allocation frame (capacity allocation 20, fig. 4) to the first transmitting radio network node, said allocation frame indicating the number of data units the first transmitting radio network node is given permission to transmit, this latter number being referred to as credits ("Next Node-B sends an allocation frame, represented by the uppermost arrow 20, indicating the amount of credits that SRNC is allowed to send for UE1. This amount is indicated in the granted credits frame field" page 4 lines 15-17).

The limitation, the second transmitting radio network node, if buffer resources for storing of data units at the second transmitting radio network node are limited for each data flow between the first and second transmitting radio network nodes ("Node-B allocates some capacity based on the free buffer space available in the buffer of UE1 in Node-B" page 4 lines 8-9).

The limitation, counting the instantaneous number of requested data units in each data flow to obtain a total number of requested data units ("the amount of pending user data in SRNC for UE1" page 4 lines 7-8 and "Credits given an individual UE with the above known "per flow" based credit assignment scheme are independent credits

given another UE. It is called "per flow" based because each user data flow is independent of other flows" page 5 lines 14-16).

computing the total number of credits to be granted in each data flow by subtracting from a target buffer filling level for the total number of data flows the total number of data units currently stored in each of the buffers and the total number of credits previously given but not yet received ("Node-B allocates some capacity based on the free buffer space available in the buffer of UE1 in Node-B. Expressed in very general terms and non-complete manner the free buffer space is a buffer's maximum memory space minus any outstanding credits. Expressed in very general terms and incomplete manner the term "outstanding credits" refers to user data that have been granted credit for transmission from SRNC to Node-B but have not yet been received by Node-B" page 4 lines 10-13).

However, APA does not explicitly disclose computing the total number of credits to be granted in each data flow by subtracting from a target buffer filling level for the total number of data flows the total number of data units currently stored in each of the buffers and the total number of credits previously given but not yet received.

Nevertheless, Calvignac discloses "The number of credits to be issued to the Dataflow ASIC for each input queue is then calculated by subtracting the filling level of the queue and the outstanding credits register for the queue from the maximum credits register for the queue" (Calvignac [0067]).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to compute the total number of credits to be granted

in each data flow by subtracting from a target buffer filling level for the total number of data flows the total number of data units currently stored in each of the buffers and the total number of credits previously given but not yet received because it will allow "credit generation logic for managing the flow of dispatch messages "(Calvignac [0067]).

In addition, APA, Calvignac discloses everything claimed as applied above. However, APA, Calvignac does not explicitly disclose distributing the total number of credits proportionally to radio channel qualities indicated by said user entities.

Nevertheless, Liu discloses "After the transmit power for each wireless is optimized, the base station may then select the affordable data rates for each wireless unit according to the allocated power. As a result, wireless units having more attractive CQI values may be given preferential treatment. More particularly, the wireless units having more attractive CQI values may be allocated more power from the base station's resources to transmit data. In contrast, wireless units having less attractive channel conditions may be allocated less power from the base station's resources to transmit data" (Liu [0038]).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to distribute the total number of credits proportionally to radio channel qualities indicated by said respective user entities because "Once the transmit power level for each wireless unit has been selected, the method designates a transmission rate for each wireless unit in response to the CQI for each unit" (Liu [0016]).

Regarding claim 14, APA, Calvignac, Liu disclose everything claimed as applied above (see claim 13). However, APA does not explicitly disclose limiting the total sum of user data in all data streams to a desired value less than or equal to the total requested number of data units.

Nevertheless, Calvignac discloses "the maximum credit registers specify the maximum number of credits to be issued for transfer of frames into each input queue" (Calvignac [0067]).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to limit the total sum of user data in all data streams to a desired value less than or equal to the total requested number of data units because it will allow "credit generation logic for managing the flow of dispatch messages "(Calvignac [0067]).

2. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Liu.

Regarding claim 15, APA discloses a control method for regulating the flow of data between a first transmitting radio network node and a second transmitting radio network node in a radio transmission network (figs. 1-4).

The limitation, said second transmitting radio network node receiving data from said first transmitting radio network node to be forwarded to plural user entities via an air interface (fig. 1).

The limitation, the first transmitting radio network node sends a capacity request (capacity request 19, fig. 4) to the second transmitting radio network node requesting

the second transmitting radio network node for permission to send an indicated number of data units that are pending in the first transmitting radio network node ("A capacity request frame, illustrated by arrow 19, is sent by SRNC thus informing Node-B's buffer 9 about the amount of pending user data in SRNC for UE1" page 4 lines 6-8).

The limitation, the second transmitting radio network node, in response to the capacity request, sends an allocation frame (capacity allocation 20, fig. 4) to the first transmitting radio network node, said allocation frame indicating the number of data units the first transmitting radio network node is given permission to transmit, this latter number being referred to as credits ("Next Node-B sends an allocation frame, represented by the uppermost arrow 20, indicating the amount of credits that SRNC is allowed to send for UE1. This amount is indicated in the granted credits frame field" page 4 lines 15-17).

However, APA does not explicitly disclose distributing the number of credits given by the second transmitting radio network node proportionally to the radio channel qualities indicated by the respective user entities to which the second transmitting radio network node is scheduling radio transmission of data units.

Nevertheless, Liu discloses "After the transmit power for each wireless is optimized, the base station may then select the affordable data rates for each wireless unit according to the allocated power. As a result, wireless units having more attractive CQI values may be given preferential treatment. More particularly, the wireless units having more attractive CQI values may be allocated more power from the base station's resources to transmit data. In contrast, wireless units having less attractive channel

conditions may be allocated less power from the base station's resources to transmit data" (Liu [0038]).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to distribute the total number of credits proportionally to radio channel qualities indicated by said respective user entities because "Once the transmit power level for each wireless unit has been selected, the method designates a transmission rate for each wireless unit in response to the CQI for each unit" (Liu [0016]).

Regarding claim 16, APA discloses a radio network node for regulating the flow of data from a transmitting node (figs. 1-4).

The limitation, a buffering resource (fig. 2).

The limitation, a capacity allocation device for allocating individual amounts of user data to individual user entities ("A capacity request frame, illustrated by arrow 19, is sent by SRNC thus informing Node-B's buffer 9 about the amount of pending user data in SRNC for UE1" page 4 lines 6-8).

The limitation, a flow control protocol and a scheduler (figs. 1-4).

The limitation, the capacity allocation device comprises a counter for keeping a running count of the instantaneous number of outstanding credits, outstanding credits being defined as the number of data units that the allocation device has permitted the transmitting node to send, although the corresponding number of data units has not yet arrived at the radio network node ("the free buffer space is a buffer's maximum memory space minus any outstanding credits … outstanding credits refers to user data that have

been granted credit for transmission from SRNC to Node-B but have not yet been received by Node-B" page 4 lines 11-14 and "Credits given an individual UE with the above known "per flow" based credit assignment scheme are independent credits given another UE. It is called "per flow" based because each user data flow is independent of other flows" page 5 lines 14-16).

However, APA does not explicitly disclose a distribution device adapted to distribute the total number of credits given by the radio network node proportionally to radio channel qualities indicated by said respective user entities to which the scheduler is scheduling radio transmission of data units.

Nevertheless, Liu discloses "After the transmit power for each wireless is optimized, the base station may then select the affordable data rates for each wireless unit according to the allocated power. As a result, wireless units having more attractive CQI values may be given preferential treatment. More particularly, the wireless units having more attractive CQI values may be allocated more power from the base station's resources to transmit data. In contrast, wireless units having less attractive channel conditions may be allocated less power from the base station's resources to transmit data" (Liu [0038]).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to distribute the total number of credits proportionally to radio channel qualities indicated by said respective user entities because "Once the transmit power level for each wireless unit has been selected, the

method designates a transmission rate for each wireless unit in response to the CQI for each unit" (Liu [0016]).

Regarding claim 17, APA, Liu disclose everything claimed as applied above (see claim 16). In addition, APA discloses the capacity allocation device comprises a counter for keeping a running count of user data pending in the transmitting node ("the amount of pending user data in SRNC for UE1" page 4 lines 7-8).

(10) Response to Argument

1.) CLAIMS 13 AND 14 ARE PATENTABLE OVER APPLICANT'S "ADMITTED PRIOR ART" ("APA") IN VIEW OF CALVIGNAC AND LIU

Regarding claims 13, 14, Applicants have argued that "Nothing that the Examiner has pointed to in the teachings of Liu involves a credit-based system for regulating the flow of data between first and second radio network nodes for data to be forwarded to plural user entities via an air interface" (page 7).

In response to Applicants' argument, the examiner respectfully disagrees. As disclosed in the previous office action and similarly reproduced above, Applicants' admitted prior art had been relied upon to disclose a credit-based system. As shown in figures 1-4 in the instant application and further in the corresponding sections of the specification, Applicants' admitted prior art discloses "Data for each user arrives from the core network to SRNC where it is stored in buffers 8 each one associated with a

respective user… From the SRNC a user's stored data is transferred to the Node-B where it is temporarily stored in a corresponding individual buffer 9. From Node-B a user's data is sent to the individual UE over the air interface Uu" (specification page 2 lines 8-14). This shows that data is forwarded to plural user entities via an air interface. In addition, Applicants' admitted prior art discloses "In the frame protocol, a credit-based flow control mechanism is used where capacity request frames 10 and capacity allocation frames 11 are exchanged between Node-B and SRNC separately for the individual users and therefore also for the corresponding individual data streams 12. The capacity request frames are sent by SRNC informing Node-B's buffer on the number of MAC-d Protocol Data Units (MAC-d PDU) that are pending (queuing) in the SRNC buffer for the respective UE. In response to the reception of a capacity request frame Node-B transmits an allocation frame to the SRNC, said allocation frame indicating the amount of MAC-d PDUs that SRNC is allowed to send to the UE. When SRNC has received the allocation frame it transmits the indicated number of MAC-d PDU to SNRC. The number of MAC-d PDUs Node-B permits SRNC to transmit are called credits" (specification page 2 lines 15-24). This shows a credit-based system between a first and a second radio network nodes where the flow of data is regulated. Therefore, Applicants' admitted prior art discloses a credit-based system for regulating the flow of data between first and second radio network nodes for data to be forwarded to plural user entities vi an air interface.

Regarding claims 13, 14, Applicants have argued that "nothing in Liu relates to "distributing [a] total number of credits proportionally to radio channel qualities indicated

by [] user entities." The Examiner merely points to a portion of Liu that describes adjusting power levels as a function of CQI values; after selecting such power levels, a base station can then select "affordable data rates for each wireless unit according to the allocated power." Even if the setting of power levels, or the selection of "affordable data rates," were considered analogous to distributing credits, as presented in claim 13, Liu expressly teaches that the selection of a transmission rate for each wireless unit "is performed in response to the CQI signal(s) of each wireless unit," and that "the appropriate data transmission rate for a wireless unit [is determined] in view of its CQI signal(s)." Thus, even if data transmission rates for multiple wireless units (i.e., "plural user entities" as used in claim 13) is considered analogous to distributing credits to regulate the flow of data in buffers, Liu teaches setting the data transmission rate for each wireless unit as a function of each such unit's CQI values; i.e., there is no proportional distribution of data transmission rates as a function of some total value." (pages 7-8), and "Claim 13 concludes with the limitation of: "distributing the total number of credits proportionally to radio channel qualities indicated by said user entities." (emphasis added). As those skilled in the art will recognize, if there are a "total" number of credits, and they are distributed "proportionally," then granting more transmission credits to one entity will, necessarily, reduce the number that can be granted to another entity" (pages 8-9).

In response to Applicants' arguments, the examiner respectfully disagrees. As disclosed above, Applicants' admitted prior art had been relied upon to disclose a credit-based system between a first and a second transmitting radio network nodes. In the

claim, credits are the number of data units a node is given permission to transmit, which is to say that credits are related to the amount of bandwidth being permitted to transmit. Similarly, Liu discloses distributing a total transmission power and transmission data rates for each wireless unit, which are related to the amount of bandwidth being permitted to transmit. The prior art reference Liu had been relied upon to disclose a proportional distribution of total bandwidth to radio channel qualities indicated by the user entities. Liu discloses "the base station may compute the required transmit power for each wireless unit based on the most recent CQI signal(s)" [0034], "By jointly optimizing the transmit power and rate control, the likelihood that each tone may approach the capacity dictated by the channel condition and the overall downlink capacity may be maximized. Here, a base station designed for multiple access may optimize the **overall downlink transmission rate** and the rate for each scheduled wireless unit by scheduling one or multiple wireless units. Moreover, selecting one or multiple blocks of sub-carriers for each wireless unit within one scheduling instance in response to the CQI signals available at the time of scheduling may optimize **the overall downlink transmission rate** and the rate for each scheduled wireless unit. After the transmit power for each wireless is optimized, the base station may then select the affordable data rates for each wireless unit according to the allocated power. As a result, wireless units having more attractive CQI values may be given preferential treatment. More particularly, the wireless units having more attractive CQI values may be allocated more power from the **base station's resources to transmit data**. In contrast, wireless units having less attractive channel conditions may be allocated less

power from the **base station's resources to transmit data**" [0037-0038] (The CQI is the channel quality information, where "The CQI signal(s) from each wireless unit define the various attributes of the channel over which data may be transmitted on the downlink" [0024], which reads on the claimed limitation "radio channel qualities"). This shows that the transmission data rate is selected based on the transmit power and the transmit power for each wireless unit is allocated based on the received CQI. In addition, Liu discloses "This step of allocating the transmit power from a base station's budget may be executed in accordance with any number of prioritization or scheduling schemes. Here, the **pool of received CQI signals** are evaluated and ranked. By this arrangement, **a wireless unit having the lowest attenuation pattern, for example, may receive a greater portion of the transmit power budget than the remainder of the wireless units that have had their CQI signals received**" [0026] and the mathematical equations following paragraph [0034] disclose a correlation between a **total transmit power** for the data (**Ptotal**) based on the channel quality information value associated with the i-th frequency block (CQIi). This shows that with a total transmit power for the data, transmit powers are distributed proportionally; such that with a total transmit power, granting one wireless unit more transmit power will reduce the transmit power that can be granted to another wireless unit. The total transmit power and the overall downlink capacity (which are read on claim 13's "total number of credits") are distributed proportionally to channel quality information. Therefore, Liu discloses distributing the total number of credits proportionally to radio channel qualities indicated by said user entities.

2.) CLAIMS 15-17 ARE PATENTABLE OVER APA IN VIEW OF LIU

Regarding claims 15, 16, Applicants have argued that "Independent claims 15 and 16 recite limitations analogous to those of claim 13 and, thus, they are also distinguishable over APA and the teachings of Calvignac and Liu" (page 9).

In response to Applicants' argument regarding claim 15, the examiner respectfully disagrees. It is noted that claim 15 does not fully correspond to the limitations as argued with claim 13. Claim 15 does not include the limitation "the total number of credits", as claimed in claim 13, and instead discloses "the number of credits". However, the examiner maintains the rejection because, as described above, Liu discloses the total transmit power and transmission data rate being distributed proportionally to channel quality information indicated by each wireless unit.

Further, in response to Applicants' argument regarding claim 16, the examiner respectfully disagrees. The examiner maintains the rejection for the same reasons described above with claim 13 because Liu discloses the total transmit power and transmission data rate being distributed proportionally to channel quality information indicated by each wireless unit.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Christine Duong/
Examiner, Art Unit 2462
03/17/2011

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